## CLAIMS

What is claimed is:

1	1. In a computerized device, a method for distributing content in a content distribution
2	network, comprising the steps of:
3	sending a multicast message to a plurality of content engine receivers, the
4	multicast message including content to be distributed among the plurality of content
5	engine receivers;
6	waiting a predetermined period for a negative acknowledgment message from at
7	least one of the plurality of content engine receivers; and
8	if a negative acknowledgment message from at least one of the plurality of
9	content engine receivers is received before expiration of a predetermined period, then
10	resending the multicast message a predetermined number of times.
1	2. The method of claim 1 further comprising the steps of:
2	receiving a second negative acknowledgment message from one of the plurality of
3	content engine receivers after resending the multicast message the predetermined
4	number of times; and
5	sending a unicast message of content to be distributed in response to the second
6	negative acknowledgment message to the one content engine receiver.
1	3. The method of claim 1 further comprising the steps of:
2	receiving a negative acknowledgment message from one of the plurality of content
3	engine receivers after the predetermined period has expired; and
4	sending a unicast message of content to be distributed to the one content engine
5	receiver in response to the negative acknowledgment message received after the
6	predetermined period has expired.

l	4. The method of claim 1 wherein the step of sending further comprises the step of
2	sending the multicast message in response to a negative acknowledgment message from
3	at least one of the plurality of content engine receivers.
1	5. The method of claim 4 wherein the step of sending further comprises the steps of:
2	contacting a primary content engine sender before sending the multicast message;
3	sending the multicast message to the plurality of content engine receivers if the
4	primary content engine does not respond to the contacting; and
5	disregarding the negative acknowledgment if the primary content engine does
6	respond to the contacting.
1	6. The method of claim 1 wherein the negative acknowledgment includes a request for at
2	least one file not received in the multicast message, and wherein the step of resending the
3	multicast message further comprises resending only the at least one file requested in the
4	negative acknowledgment.
1	7. The method of claim 6 wherein a plurality of negative acknowledgments are received
2	during the predetermined period, each negative acknowledgment including a request for
3	at least one file not received in the multicast message, and wherein the step of resending
4	the multicast message further comprises the steps of:
5	aggregating the files requested in the plurality of negative acknowledgments; and
6	resending the multicast message including the aggregated files.
1	8. The method of claim 1 wherein the multicast message includes a plurality of files, each
2	file of the plurality having an associated count value, the associated count value
3	indicating the number of times the file has been transmitted by the computerized device,
4	the method further comprising the step of incrementing the associated count value each
5	time the computerized device transmits a file.

1	9. The method of claim 8 wherein the negative acknowledgment includes a request for at
2	least one file not received in the multicast message, and wherein the step of resending the
3	multicast message further comprises resending the at least one file until the associated
4	count for the at least one file equals the predetermined number.
1	10. In a computerized device, a method for distributing content in a content distribution
2	network, comprising the steps of:
3	receiving a negative acknowledgment message from one of a plurality of content
4	engine receivers;
5	checking a primary content engine sender for status;
6	if the primary content engine sender is active,
7	a) disregarding the negative acknowledgment message; and
8	b) if a second negative acknowledgment message is received, sending a
9	network alert; and
10	if the primary content engine sender is inactive, sending a multicast message to the
11	plurality of content engine receivers in response to the negative acknowledgment
12	message.
1	11. In a computerized device storing distributed content in a content distributed network,
2	a method for maintaining content comprising the steps of:
3	scanning the distributed content stored on the computerized device;
4	if missing files are discovered in the scanning step, sending a negative
5	acknowledgment message to a primary content sender requesting the missing files; and
6	if a response to the negative acknowledgment is not received from the primary content
7	sender, sending the negative acknowledgment message to a secondary content sender
8	thereby triggering a backup system.
1	12. A content engine sender, comprising:

2	means for sending a multicast message to a plurality of content engine receivers,
3	the multicast message including content to be distributed among the plurality of content
4	engine receivers;
5	means for waiting a predetermined period for a negative acknowledgment
6	message from at least one of the plurality of content engine receivers; and
7	means for if a negative acknowledgment message from at least one of the
8	plurality of content engine receivers is received before expiration of a predetermined
9	period, then resending the multicast message a predetermined number of times.
1	13. A computer program product having a computer-readable medium including
2	computer program logic encoded thereon that, when performed on a computer system
3	directs the computer system to perform the method of:
4	sending a multicast message to a plurality of content engine receivers, the
5	multicast message including content to be distributed among the plurality of content
6	engine receivers;
7	waiting a predetermined period for a negative acknowledgment message from at
8	least one of the plurality of content engine receivers; and
9	if a negative acknowledgment message from at least one of the plurality of
10	content engine receivers is received before expiration of a predetermined period, then
11	resending the multicast message a predetermined number of times.
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1	14. A computerized device for distributing content in a content distribution network
2	comprising:
3	a processor;
4	a memory;
5	a network interface;
6	an connection circuitry coupling the processor, the memory and the network
7	interface;
8	wherein the memory is encoded with logic that when executed by the processor as
9	a process, causes the computerized device to perform the operations of:

sending a multicast message, via the network interface, to a plurality of content 10 engine receivers, the multicast message including content to be distributed among the 11 plurality of content engine receivers; 12 waiting a predetermined period for a negative acknowledgment message, received 13 on the network interface from at least one of the plurality of content engine receivers; and 14 if a negative acknowledgment message from at least one of the plurality of 15 content engine receivers is received before expiration of a predetermined period, then 16 resending the multicast message a predetermined number of times via the network 17 18 interface. 15. The computerized device of claim 14 wherein the logic further causes the 1 computerized device to perform the operations of: 2 receiving a second negative acknowledgment message from one of the plurality of 3 content engine receivers after resending the multicast message the predetermined 4 number of times; and 5 sending a unicast message of content to be distributed in response to the second 6 negative acknowledgment message to the one content engine receiver. 7 16. The computerized device of claim 14 wherein the logic further causes the 1 computerized device to perform the operations of:: 2 receiving a negative acknowledgment message from one of the plurality of content 3 engine receivers after the predetermined period has expired; and 4 sending a unicast message of content to be distributed to the one content engine 5 receiver in response to the negative acknowledgment message received after the 6 predetermined period has expired. 7 17. The computerized device of claim 14 wherein when the logic causes the 1 computerized device to perform the operation of sending, the logic causes the 2 computerized device to perform the operation of sending the multicast message in 3

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4	response to a negative acknowledgment message from at least one of the plurality of
5	content engine receivers.
1	18. The computerized device of claim 17 wherein when the logic causes the
2	computerized device to perform the operation of sending, the logic causes the
3	computerized device to perform the operations of:
4	contacting a primary content engine sender before sending the multicast message;
5	sending the multicast message to the plurality of content engine receivers if the
6	primary content engine does not respond to the contacting; and
7	disregarding the negative acknowledgment if the primary content engine does
8	respond to the contacting.
1	19. The computerized device of claim 1 wherein the negative acknowledgment includes
2	a request for at least one file not received in the multicast message, and wherein when the
3	logic causes the computerized device to perform the operation of resending, the logic
4	causes the computerized device to perform the operation of resending only the at least
5	one file requested in the negative acknowledgment.
1	20. The computerized device of claim 19 wherein a plurality of negative
2	acknowledgments are received during the predetermined period, each negative
3	acknowledgment including a request for at least one file not received in the multicast
4	message, and wherein when the logic causes the computerized device to perform the
5	operation of resending the multicast message, the logic causes the computerized device to
5	perform the operations of:
7	aggregating the files requested in the plurality of negative acknowledgments; and
8	resending the multicast message including the aggregated files.
1	21. The computerized device of claim 1 wherein the multicast message includes a
2	plurality of files, each file of the plurality having an associated count value, the
3	associated count value indicating the number of times the file has been transmitted by the

4	computerized device, and wherein the logic causes the computerized device to perform
5	the operation of incrementing the associated count value each time the computerized
6	device transmits a file.
1	22. The computerized device of claim 21 wherein the negative acknowledgment includes
2	a request for at least one file not received in the multicast message, and wherein when the
3	logic causes the computerized device to perform the operation of resending the multicast
4	message further, the logic causes the computerized device to perform the operation of
5	resending the at least one file until the associated count for the at least one file equals the
6	predetermined number.
1	23. A computerized device for distributing content in a content distribution network, the
2	computerized device comprising:
3	a processor;
4	a memory;
5	a network interface;
6	an connection circuitry coupling the processor, the memory and the network
7	interface;
8	wherein the memory is encoded with logic that when executed by the processor,
9	performs operations of:
10	receiving, via the network interface, a negative acknowledgment message from
11	one of a plurality of content engine receivers;
12	checking a primary content engine in the memory sender for status;
13	if the primary content engine sender is active,
14	a) disregarding the negative acknowledgment message received via the
15	network interface; and
16	b) if a second negative acknowledgment message is received via the
17	network interface, sending a network alert via the network interface; and

	1	if the primary content engine sender is inactive, sending a multicast message via the
	2	network interface to the plurality of content engine receivers in response to the negative
	3	acknowledgment message.
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1		24. A computerized device storing distributed content in a content distributed network,
2		the computerized device comprising:
3		a processor;
4		a memory;
5		a storage area;
6		a network interface;
7		an connection circuitry coupling the processor, the memory and the network
8		interface and the storage area;
9		wherein the memory is encoded with logic for maintaining content in a storage
10		area, the logic, when executed by the processor, performs operations of:
11		scanning the distributed content stored on the computerized device in the storage area;
12		if missing files are discovered in the scanning operation, sending, via the network
13		interface, a negative acknowledgment message to a primary content sender requesting the
14		missing files; and
15		if a response to the negative acknowledgment is not received from the primary content
16		sender via the network interface, sending, via the network interface, the negative
17		acknowledgment message to a secondary content sender thereby triggering a backup
18		system.

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l		25. A device for distributing content in a content distribution network,
2		comprising;
3		a memory;
4		a storage device to store a multicast period and a threshold number of multicast passes;
5		the storage device further to store content to be distributed in the content
6		distributed network; and
7		a controller in communication with the memory and the storage device, the controller
8 9 10 11 12 13 14		acting with the memory to control the device, the controller configured to send multicast message to a plurality of content engine receivers, the multicast message to include at least a portion of the content, the controller further configured to wait the multicast period for a negative acknowledgment message from at least one of the plurality of content engine receivers, the controller further configured to resend the multicast message the threshold number of multicast passes if a negative acknowledgement message is received before expiration of the multicast period.
1 2 3		26. The device of claim 25 wherein the controller is further configured to send a unicast message in response to a second negative acknowledgment message received after expiration of the multicast period.
	1 2 3	27. The device of claim 25 wherein the controller is further configured to send a unicast message in response to a second negative acknowledgment message received after the multicast message is sent the threshold number of multicast passes.